



UNITED STATES NAVY

# MEDICAL NEWS LETTER

Rear Admiral Bartholomew W. Hogan MC USN - Surgeon General  
Captain Donald R. Childs MC USN - Editor

Vol. 34

Friday, 21 August 1959

No. 4

1842

Bureau of Medicine and Surgery

1959

117th Anniversary

\* \* \*

## MESSAGE FROM THE SURGEON GENERAL

To All Officers and Men of the Medical Department:

On the occasion of another anniversary, it is appropriate to reflect on the progress of the Navy Medical Department. As indicated in the historical sketch that follows in this issue of the Medical News Letter, the accomplishments have been manifold and continuous. The future promises even more achievements—some more spectacular—as medical problems of atomic submarine and space travel are resolved.

Yet, recognizing the need for, and beneficial results of, such research and development in new areas of medicine, the principal purpose of the Medical Department continues to be the day to day maintenance of a high level of professional care and personal relationship which is contributed to by each individual officer and man of the various Corps of the Department. I take personal satisfaction in the contribution each individual has made, often in the face of shortages of funds and personnel, and extend congratulations to all—Regular and Reserve, active and inactive. The maintenance of, and improvement on, the enviable record of the past is a challenge to us all.

\* \* \* \* \*



## TABLE OF CONTENTS

Message from the Surgeon General .....	1
History of the Medical Department .....	3
Choice and Use of New Drugs .....	6
Prevention of Rabies in Man .....	9
Survival in Acute Leukemia .....	10
Treatment of Hypercholesterolemia .....	11
Occlusive Disease of the Carotid Arteries .....	12
Prognosis for Rehabilitation in Strokes .....	13
Physiology of Dumping Syndrome .....	15
Stimulation of Bone Growth .....	17
BuMed Receives Film Festival Certificate .....	18
Words of Approbation .....	19
Medical Defense Against Chemical Warfare - Film Release .....	20
New Look in Ophthalmic Frames .....	21
Postgraduate Short Courses at Armed Forces Institute of Pathology .....	22
Board Certifications .....	22
IN MEMORIAM .....	23
Recent Research Reports .....	23
From the Note Book .....	25
Influenza Vaccination Program (BuMed Notice 6230) .....	28

### DENTAL SECTION

Management of Gagging Patients .....	29
More About Fluoridation .....	29
Personnel News .....	30
Dental Service Report (DD 477) .....	30

### RESERVE SECTION

Armed Services Orthopedic Seminar .....	31
Meeting of American Psychological Association .....	31
Revision of Promotion Policy .....	31
New Identification Cards for Inactive Reservists .....	32

### AVIATION MEDICINE SECTION

Indoctrination and Fleet Evaluation of Navy's Full Pressure Suit .....	33
Cardiac Arrest (Bibliography) .....	37
Reserve Seminar in Aviation Medicine .....	38
The Navy Doctor .....	38

\* \* \* \* \*



### History of the Medical Department

The story of the Medical Department of the United States Navy is one to arouse pride and stimulate enthusiasm in every American citizen. Continuous strides—at times stupendous—have been taken in the quality of medical care provided for personnel of the Navy and Marine Corps.

It is well to note and give thought to the advances that have been made beyond the conditions of ignorance and neglect prevalent in the eighteenth century. Then, disease and pestilence being rampant, a severely wounded sailor had little hope of survival. Now, the morbidity rate in the Navy has been reduced to the lowest point in history, and during the Korean Conflict the mortality rate of 2% for the Navy and Marine Corps personnel wounded in combat was an all time low.

The practice of naval medicine in America had its beginnings late in 1775 when the first American fleet was placed in commission by Acts of the Continental Congress. Physicians originally were selected by commanders of naval vessels to serve on individual voyages, and often were assisted only by the oldest or most incompetent of the seamen on board. Much of the financial reward the surgeon could expect consisted of a share in such booty as the ship might capture.

In 1798, when the Navy Department was established, surgeons and surgeon's mates were given the status of commissioned officers. For the next 44 years there was no medical department, only individual officers, not organized in any sense, participating in a gradual evolution toward adequate medical support of the Navy. A Marine Hospital Fund, established by monthly payments from all seamen, subsequently augmented by money from fines and forfeitures, financed hospitals, most of which were in unsatisfactory buildings selected without plan. A major accomplishment of the Fund was the arrangement for building the first permanent hospital. This was located at Norfolk, Va., where the first patients were received in 1830. Other hospitals, financed by regular appropriations, soon followed—Philadelphia in 1833, Boston in 1836, and Brooklyn in 1838.

Throughout the early portion of the nineteenth century a number of able and energetic physicians fought for a well organized and adequately equipped medical department. Their efforts resulted in improvement in quality of professional personnel, medical equipment and supplies, and quarters for the sick on board ships and at hospitals ashore.

William P. C. Barton, outstanding among this group, was responsible for establishing a medical journal on each patient and a medical library in each naval medical unit. His proposal for utilizing female nurses in hospitals went unheeded for two generations. Perhaps his greatest contribution was the writing of "A Plan for the Internal Organization and Government of Marine (Navy) Hospitals. This treatise and his continuous efforts had much to do with the establishment in 1842 of the Bureau of Medicine and Surgery which was created to supervise naval medical affairs along the lines he had proposed.



Most appropriately, he was named the first Chief of the Bureau. The title, Surgeon General—not created until 1871—was first held by William M. Wood, the fifth Chief of the Bureau.

From its inception, the new Bureau made notable progress in organizing, developing, and perfecting naval medicine. Fascinating accounts of many aspects of this progress can be found in the reports to the Secretary of the Navy made each year since Civil War times by the Chief of the Bureau or, after 1871, by the Surgeon General. This unbroken series has been of great value to students of preventive medicine, vital statisticians, and public health authorities, in determining trends of morbidity and mortality rates.

One early development—the establishment of hospitals in ships—conferred mobility on definitive medical and surgical care. The best known hospital ship employed during the Civil War, RED ROVER, was a Mississippi sidewheeler captured from Confederate forces and converted for use as a hospital under the command of Surgeon Ninian Pinkney. The staff included the first female nurses of record in the Navy. They were Nursing Sisters who volunteered only for service during the war.

Other hospital ships followed. Of these, the USS SOLACE, converted to hospital use in 1898 during the Spanish-American War, was the first of our naval vessels to fly the Geneva Red Cross flag. A long controversy over whether a medical or line officer should command such a ship ended in placing a line officer in command of the ship proper, with a medical officer in command of the hospital within the ship and all professional medical matters.

During World War I and World War II, more and more advanced hospital ships were developed. Near the close of the latter war, some 12 hospital ships were in operation by the Navy. Still greater effectiveness was achieved during the Korean Conflict by the addition of landing platforms for helicopters so that casualties could be flown in a matter of minutes from close behind the front line to the safety and expert care available on the ship. Such atraumatic and expeditious handling saved many lives.

Other early developments of great value were instituted by the Bureau of Medicine and Surgery. A book, Instruction for Medical Officers, now known as the Manual of the Medical Department, was first published in 1886. A Naval Medical School, for postgraduate instruction in special aspects of naval medicine, was established by Surgeon General Presley M. Rixey in 1902 for indoctrination of newly appointed Medical officers. Annual physical examinations of naval personnel were begun in 1909. To provide current professional reports to Medical Department personnel, publication of the U. S. Naval Medical Bulletin was inaugurated in 1907. The Bulletin, with its successor, the U. S. Armed Forces Medical Journal, has been published continuously to the present day. A supplementary Hospital Corps Quarterly—now the Medical Technicians Bulletin—was provided for nonprofessional Medical Department personnel.

The term, Medical Corps, was first employed in an appropriation act of 1871. Thereafter, Medical officers were listed as members of the Staff Corps



of the Navy. Their grades were Medical Director, Medical Inspector, Surgeon, Passed Assistant Surgeon, and Assistant Surgeon with the respective ranks of Captain, Commander, Lieutenant Commander, Lieutenant, and Master (later changed to Lieutenant, junior grade). Since 1918, Medical officers have held the regular military titles of their rank.

Prior to 1898, enlisted assistants to Medical officers were known successively as loblolly boys, surgeon's stewards, apothecaries, nurses, and baymen. In that year, the Hospital Corps was established by legislation which specified qualifications and duties. The 61 years that have elapsed since then have seen the Hospital Corps demonstrate increasingly high morale and technical competence based on fine quality of personnel assigned to the Corps and careful training afforded each member.

The Navy Nurse Corps was established without commissioned rank in 1908. Female nurses then began to serve ably in many shore-based hospitals and on hospital ships. In World War II, over 11,000 nurses were in service. An Act of 1947 made members of the Nurse Corps permanently commissioned staff officers with rank, pay, and allowances equal to those of other staff officers up to, and including, Captain. Officers of the Nurse Corps have performed invaluable service in field medical units in Japan and Korea, in troop air transports, on hospital and sea transport ships, and in all shore-based hospitals.

The Dental Corps, established in 1912, has provided Dental officers who have served with distinction in both world wars and in Korea. Over 7,000 were in service during World War II. In 1945, an organization change in the Bureau of Medicine and Surgery assigned to Dental officers the technical control of dental activities ashore and afloat.

The Medical Service Corps was established in 1947, giving commissioned rank to administrative specialists and men trained in such fields as pharmacy, optometry, psychology, bacteriology, and other sciences related to medicine. Officers of the Medical Service Corps, with ranks up to, and including, Captain have been of immeasurable assistance to Medical and Dental officers by absorbing much of the administrative work load and serving as specialists in various sciences.

During the present century, training and technical education have expanded continuously in step with growing specialization, increasing complexity of the medical sciences, and enlarging scope of Medical Department operation. In 1902, in addition to the Naval Medical School, there was established at Norfolk, Va., the first school for training hospital corpsmen. In 1922, the Naval Dental School was inaugurated for postgraduate training of Dental officers. In 1939, the Naval School of Aviation Medicine was set up at Pensacola, Fla.; in 1942, the Naval School of Hospital Administration was opened at Bethesda, Md.; and in 1951, Field Medical Service Schools were commissioned at Camp Pendleton and Camp Lejeune.

The Bureau of Medicine and Surgery, observing its 117th anniversary on 31 August 1959, is the only Navy Bureau retaining its original name as



established by Congress in 1842. However, only since 1942 has it occupied the present quarters in a group of buildings which includes the old Naval Observatory. The more recent accomplishments of the Medical Department of the United States Navy and those of the devoted officers and men who constitute it have been so many and varied that they cannot be mentioned in this short historical sketch. Suffice it to say that naval medicine has made tremendous progress since 1775 and in recent years has been enormously accelerated. Today, the quality of professional care furnished to Navy and Marine Corps personnel is outstanding and second to none. (Adapted from historical sketch in Anniversary Book, U.S. Naval Hospital and U.S. Naval Hospital Corps School, San Diego, Calif., 1919-1958)

\* \* \* \* \*

### Choice and Use of New Drugs

"Due to the extremely fertile mating of the synthetic chemist and the pharmaceutical manufacturer, drugs appear on the market almost too quickly for one to learn the names, to say nothing of distinguishing which are the same drugs with different proprietary names." This constitutes a serious problem when it is realized that some 550 new preparations a year, or more than one a day, are introduced to practicing physicians. The results of lack of information relative to these preparations are evident when it is seen that 5% of 1,000 consecutive admissions to a major hospital in New York City are because of undesirable effects of some of these new agents. Ignorance of uses, limitations, and dangers are the major handicap to the physician faced with such a vast armamentarium. Certainly, the patient resents being used in any trial-and-error process. Therefore, the background work of any new drug is critical information.

The responsibility of chemist and drug manufacturer lies in careful study of the pharmacologic and physiologic properties of the new chemical in the laboratory animal, with accurate and complete translation to similar processes in the human being. Premature publicity in the lay press may result in undue pressure for clinical application before all facets of the effects of a new chemical are understood. This may result in unjustified condemnation of a valuable preparation because of poor results stemming from inaccurate transference to clinical conditions.

The genius of the synthetic chemist results in a visualization of slight alterations of chemical structures and remarkably accurate anticipation of physiologic results. These alterations must be accurately tested as their effects are not necessarily as anticipated, and changes do not necessarily mean improvement. Months to years often are needed for accurate clinical appraisal.

The patterns of drug action determine whether a new chemical is of clinical applicability. Potency is an obvious primary factor. However, the listed potency of a drug may be misleading and/or inaccurate, for potency in



itself is not as important as therapeutic ratio. It does not necessarily follow that a drug producing therapeutic effects with a comparatively smaller quantity than another is more safe, nor is the converse true. Relative potency—a greater ceiling of action—determines greater desirability and applicability.

Of the untoward reactions of drugs, toxic ones are usually those capable of being anticipated, and are related to the size or duration of the dose, and exhibit an intermediary range in which some reactions may occur but are not serious. Individual response may alter the expected width of therapeutic range and mandates careful individual evaluation as therapy progresses. The minor side effects of some drugs are valuable clues to impending toxicity, while others exhibit no such warning signs and present more dangers. Allergic reactions are individual patient responses, are usually unpredictable, and may be disastrous. Some drugs and some patients exhibit this tendency. "A tainted heredity in drug as well as patient should never be ignored."

The curve of action of a drug is another essential pattern of drug action which determines the dose, frequency of dose, and site of administration. The rate and extent of absorption rigidly determine usefulness and total dose in a given situation. The features of absorption from varying sites or methods of application, in addition to full knowledge of possible intermediary processes between absorption and utilization, are of practical importance. Alteration, neutralization, or elimination also constitute features of the curve of action that must be taken into consideration.

"The amount of a drug which will produce a pharmacodynamic effect has special significance in relation to the amount of the same drug which will produce untoward effects under the same circumstances." This constitutes the therapeutic ratio, and is a more significant index of a drug's usefulness and safety than any other factor. For the therapist, it weighs the effects he seeks against the untoward reactions he fears." Variations of chemical structures are perpetually being studied in attempts at improving the therapeutic ratio.

The error of dosage is probably as frequent a cause of therapeutic failure as error in selection of the drug. Full therapeutic effects of the use of any drug are mandatory. "Enthusiasm as the only governor of the dosage regimen leads to disaster." Tailoring the dose to individual needs requires patience and experience and may be altered by the patient's condition and the influence of the condition on reactivity and elimination of the drug; on the mode of elimination and possible alteration of that function; the desired curve of action of therapy; limiting factors of dosage spacing; and—perhaps most important—individual constitutional reaction to the drug.

The average dose, meaning not the average of dose given to all patients, but rather the dose given to the average patient under average circumstances, is that which experience has shown produces desirable results without toxic effects. This dose can have wide range with some drugs, as penicillin, or more limited range with other drugs, as streptomycin. With consideration



of the previous features discussed, the dosage schedule determines the results of therapy.

To aid the practicing physician in his evaluation of the reports on new drugs, certain features of these reports need to be identified. The resolution of potential external forces on the patients of the clinical trials, such as changes in weather or even the turn of world affairs must have been considered. In other words, randomization should have been complete enough to eliminate external forces as affecting the results of observations.

Psychic forces often alter the course of the disease. All ramifications of this possible influence must have been considered, even to placebo effects of treatment. Enthusiasm or lack of enthusiasm exhibited in the ministration of the therapy on trial can produce effects on over-all evaluation. Therefore, the double-blind study is a valuable technique for making reliable conclusions.

Careful selection of appropriate subjects for evaluation of a drug under test is essential for producing worthwhile results. No less important is the appropriate dosage schedule. But probably the most important is the application of appropriate controls. Whether large numbers of alternating cases are employed or, under special circumstances, one patient serving as his own control under changing conditions, the important consideration is whether the control was a sound basis for comparison.

Attention to the details of collection of data reflects reliability of reports on drug evaluation, and the care with which statistical analysis of this data is made determines the value of the entire report. The reporting of nonsignificant data often can lend an air of authority or value to something without value. A trend or a difference which has not been proved to be significant is often misleading and should not be included in any report.

How, then, should the busy practicing physician select the best drug? "The physician must listen to unbiased voices as well as try to make substantial estimates of drug utility on his own." Medical literature is usually a reliable source of adequate evaluation since the busy practitioner does not have the time to conduct controlled experiments. However, there is usually a considerable lag between appearance of the new drug and comprehensive reviews in the medical journals attesting to its worth. Before that time, then, reliance must be placed on information that the drug manufacturer has compiled in relation to the preparatory steps for marketing the product. Publication of this work is required by law. Experiences with older drugs of the same pharmacologic family give some clues for evaluation, although such experience is not entirely dependable because slight structural alterations can result in widely divergent pharmacologic action.

A final admonition is: "Do not use a new drug in combination with other drugs; no plan of investigation is more certain to obscure the merits or disadvantages of the new drugs." (W. Modell, The Basis for the Choice and Use of New Drugs: GP, XX: 129-137, July 1959)

\* \* \* \* \*



### Prevention of Rabies in Man

Writing from the National Institutes of Health, the author points out that, although only 5 to 10 deaths from rabies are reported annually in the United States, the viral disease is still a public health problem. Each year 6,000 or more rabid animals are reported and at least 50,000 patients receive rabies vaccine. Yet, the average physician has had relatively little experience in dealing with specific problems that arise in determining the proper course of action at the time of a possible exposure to rabies.

Although the dog is man's chief source of exposure to rabies, proper methods of control and vaccination can effectively eliminate canine rabies from a given area. With gradual decrease in the number of rabid dogs, there has been a growing awareness of a considerable reservoir of rabies in foxes, skunk and bats.

The specific prophylaxis of rabies has been a standard medical procedure since the days of Pasteur, with recent research leading to refinements and innovations. Two steps are to be taken immediately when a human being is bitten by any animal: (1) identification and apprehension of the biting animal, and (2) treatment of the wound.

Observation of any animal for 10 days gives information that allows a selection of treatment. Clinical diagnosis of rabies or suspected rabies in the biting animal is sufficient indication to start treatment, although absence of Negri bodies in the brain smears does not rule out the diagnosis. If the animal is healthy 10 days after the bite, the possibility that rabies could have been transmitted is eliminated in all cases except bites by bats. In this case, the bat should be killed immediately for laboratory examination and treatment started.

If the biting animal cannot be apprehended, the clinician can only assume that the animal may have been rabid, particularly when occurring in an endemic area. Local therapy of the bite wound includes the encouragement of free bleeding, thorough mechanical cleansing, using soap or detergents and water, and fuming nitric acid in deep puncture wounds—all without suturing if possible. In bites by known rabid animals, local infiltration of up to 5 ml. antiserum is recommended.

Bites that are deeply penetrating, severely traumatic, or multiple should be considered severe exposures regardless of location, as should any bite on the head or neck. In these cases, because of short incubation period, treatment should be started immediately without regard to the status of the biting animal at the time of the bite. A single dose of antiserum should be given at once. Administration of vaccine should be started if antiserum is not available. If the biting animal remains normal, no further treatment is necessary. If vaccine therapy has been started and the animal is normal 5 days after exposure, further administration of vaccine is not indicated, provided the animal remains well during the 10-day observation period. When the animal is known to be rabid, rabies antiserum is given immediately, followed by daily doses of vaccine for 21 days.



When the exposure has been mild and the biting animal is normal, no specific prophylaxis is started. But, when the animal is definitely rabid, administration of daily doses of vaccine for a period of 14 days is indicated.

Discussion of rabies antiserum, rabies vaccine, and vaccine-induced complications is included in this report which should be referred to for these features as well as for more detailed descriptions of recommended management of various problems incident to animal bites. (Habel, K., *Prevention of Rabies in Man: Postgrad. Med.*, 25: 708-712, June 1959)

\* \* \* \* \*

### Survival in Acute Leukemia

During recent years, a variety of anti-leukemic agents have been introduced with an apparent increase in longevity of patients. However, only statistical analysis would be expected to confirm the impression. The authors compared various factors involved in survival in two groups of patients treated at their clinic—the one group being treated between March 1954 and December 1957 (89 patients) and an earlier group (78 patients) being treated during 1947 to 1954. From earlier study, it was apparent that treatment prior to 1954 had not significantly prolonged life except for one-third of the patients who achieved complete remission. A significant factor in the series treated since 1954 is the introduction of 6-mercaptopurine.

The authors' analysis revealed a significant increase in survival of the later group, with one-half of the patients living more than 8 months after symptomatic onset of disease. Measured from the date of onset of treatment, the median survival was 6 months which was double that of the earlier group. In relation to the various types, those patients with lymphoblastic leukemia showed the most significant increase in survival. Prognosis for children seemed to be more improved than that for adults, paralleling the increased longevity of those with lymphoblastic type which occurs more frequently in children. Survival in those patients with lymphoblastic leukemia was also greater when there was a low leukocyte value prior to therapy, while those with the myeloblastic type showed no such relationship. The employment of three anti-leukemic agents contributed significantly to the increased longevity figures as compared to results when only one or two agents were used. Use of 6-mercaptopurine in some series seemed to be the significant factor when a combination of agents was employed, but the fact was not borne out by analysis of the entire series, judging by median survival time.

In conducting this study, special emphasis was placed upon three aspects: (1) consistency in clinical management and record keeping; (2) objective classification of acute leukemia on morphologic grounds alone; and (3) conservative statistical treatment and interpretation. Therefore, the results of the study were considered to be justifiably significant.



In evaluating the advantages derived from therapeutic agents introduced during recent years, the authors present the following conclusions: "The question of whether to prescribe palliative therapy is no longer a prime consideration, for the temporary abeyance of symptoms afforded by drug-induced remissions in acute leukemia is well recognized and obviously desirable. We have noted above that palliative therapy has improved the outlook in acute leukemia even without limiting consideration to those patients achieving a complete remission. In addition, it is possible that some of the small gains found for certain groups may represent a real improvement and indicate the trend, even though statistical significance could not be shown. Palliative chemotherapy thus has its place, and trials of palliative agents can contribute to longevity while definitive therapy or prophylaxis is sought. It is quite clear that special effort will be required to achieve better results in myeloblastic leukemia." (Haut, A., Altman, S.J., M.M. Wintrobe, M.D., The Influence of Chemotherapy on Survival in Acute Leukemia - Comparison of Cases Treated During 1954 to 1957 with Those Treated During 1947 to 1954: Blood, XIV: 828-845, July 1959)

\* \* \* \* \*

#### Treatment of Hypercholesterolemia

A relationship between the level of blood cholesterol and development of atherosclerosis remains conjectural, although statistical evidence tends to make it definite—at least in the United States. The relationship between a high fat diet and hypercholesterolemia is more definite, yet it would be extremely difficult to indoctrinate the people of areas of high standards of living toward a radical change of diet. Some means of altering the relationship of fats, cholesterol, atherosclerosis, and coronary artery occlusion without essential alteration of the diet would seem to be the answer to the problem of the increasing incidence of coronary artery occlusion.

The authors present a study of the effect on serum cholesterol and phospholipid levels of higher 4, 5, and 6 double bonded fatty acids as there have been indications that they exhibit a greater cholesterol depressant effect than those with 2 or 3 double bonds. More highly unsaturated fatty acids are more effective in raising total blood unsaturated fatty acid level to a "normal" range at which level the greatest reduction of cholesterol is reached. Lenic Complex, a stable and not prohibitively expensive preparation obtained from crude glycerides and phosphatides from animal, fish, and vegetable sources was used, with and without nicotinic acid.

Reduction of the atherogenic cholesterol:phospholipid ratio was noted in about 80% of the 50 patients used as subjects, employing Lenic Complex, with a demonstrable synergistic relationship between Lenic Complex and



nicotinic acid. No significant side effects of either substance was encountered. In relation to the disagreement as to significance of the cholesterol: phospholipid ratio, the authors believe the evidence indicates that a 1:1 ratio is the desired "normal" under which condition the proper colloidal solution of cholesterol in the blood plasma is maintained to prevent undue precipitation of more unsaturated cholesterol esters in tissues of the body. Their employment of Lenic Complex and nicotinic acid resulted in a shift of the ratio to "normal" in 34 of the 50 patients. A point stressed by the authors is that, although actual cholesterol levels may persist above an accepted level of 220 to 250 mg., the maintenance of a normal atherogenic index is more important than the level of cholesterol alone.

The biochemical mechanisms involved in the interrelationship of the fatty acids, phospholipids, and cholesterol are extremely complex, but a brief and simplified explanation is presented. (Worne, H. E., et al., *Lenic Fatty Acid Complex in the Treatment of Hypercholesterolemia: Am. J. M. Sc.*, 238: 45-53, July 1959)

\* \* \* \* \*

### Occlusive Disease of the Carotid Arteries

The increasing employment of arteriography has contributed to some changes in the concepts of etiology, diagnosis, and therapy of "strokes" as a result of recognition of the frequency of carotid artery occlusion. This condition has a reported incidence up to 9.5% in unselected autopsies, with 39% of patients with cerebrovascular disease having significant carotid stenosis. The arteriogram may demonstrate occlusion in 14 to 21.5% of patients presenting the clinical picture of a "stroke." Atherosclerosis—as would be expected—is considered to be the most frequent cause.

The clinical features of carotid artery occlusion mimic those of many other conditions, such as the features of a slowly growing cerebral neoplasm or the catastrophic changes of a middle cerebral artery occlusion. Many patients may present recurring and intermittent symptoms which are usually considered to be occlusive phenomena of "transient ischemic attacks." This feature is also confusing as it may be seen in developing brain tumor. Some "textbook" signs are not as common as might be considered, including: transient monocular blindness with contralateral hemiplegia; ipsilateral optic atrophy; and dilatation of superficial vessels of the face. In the series of the report, the authors found that palpation of the carotid pulse in the neck and auscultation of the carotid artery or identification of an intracranial bruit were of infrequent value while the measurement of the retinal artery pressures and observations on manual compression of the contralateral carotid artery were of more consistent value in making the diagnosis.

Carotid arteriography—particularly with the newer contrast media—is considered the principal diagnostic procedure, with currently diminishing



hazards. The value of eliminating the possibility of space-occupying lesions adds importance to the desirability of the procedure. Following appropriate preliminary study, it provides an accurate method for diagnosis of a condition demanding prompt definitive measures.

The currently accepted measures of therapy are anticoagulation and reconstructive procedures of the occluded vessel. In patients with complete vascular occlusion and maximal neurologic deficit, anticoagulant therapy is usually not employed, although the authors' experience in one instance showed partial patency on repeated angiography following such therapy. The point has not been settled, although it would seem logical to assume that there is some prophylactic benefit to be gained despite unilateral occlusion. Evidence does indicate that those patients presenting recurrent "ischemic" attacks are benefited, although it must be stressed that this clinical picture is not pathognomonic of arterial occlusion alone. Furthermore, in the presence of carotid artery occlusion, reduction of occurrence of cerebral artery occlusions may be achieved by anticoagulants.

Five currently reported means of reconstruction for carotid occlusion are: (1) side-to-side anastomosis between the external and internal carotid arteries; (2) thrombectomy; (3) thrombo-endarterectomy; (4) resection of the occluded portion of the carotid artery and end-to-end anastomosis, or replacement with a venous graft, or internal-external carotid anastomosis; and, (5) bypass grafts made of nylon, dacron, or a homograft. Experience at this time does not allow adequate evaluation of any of the procedures, although it would seem that little is to be gained from the first and second procedures.

Both forms of therapy have been shown to benefit the acute complete occlusion and the slowly progressive type while both have been ineffective with the long-standing complete occlusion. Further experience will be expected to yield more clear-cut indications for specific therapy. (Silverstein, A., Occlusive Disease of the Carotid Arteries: *Circulation*, XX: 4-13, July 1959)

\* \* \* \* \*

### Prognosis for Rehabilitation in Strokes

Appalled by the lack of information and interest on the part of physicians in general in relation to rehabilitation of the hemiplegic patient, and the usual attitude of frustration and hopelessness of the physician as well as the family of the hemiplegic patient, the author undertakes to campaign for enlightenment and presents some simple guidelines for evaluation for rehabilitation of patients with strokes.

The determination of the potential benefits of a rehabilitation program for any one individual depends basically upon the presence of three positive factors, the absence of two negative factors, the avoidance of two common pitfalls, and the prevention of three complications.



Positive Factors. (1) Degree of previous activity. Those invalided or physically inactive before the stroke probably will not be good candidates for rehabilitation. In contrast to this, patients who have been active, ambulatory, and doing their daily chores have the prerequisites concerning previous activity and in most instances will do well. (2) Cerebral function. The degree of each patient's ability to cerebration in at least a receptive way, to cooperate with simple commands, and to possess some power of learning and memory must be carefully assessed. Complete restoration of former mental powers is not required. Physicians may consider mild mental confusion, memory defects, and aphasia to preclude rehabilitation, but this is often not true, since the confusion and memory defects usually involve time and incidents, but do not interfere with the execution of direct orders received from a therapist. Those with receptive aphasia of the auditory type do present problems. The aphasic patient should never be pushed to the point of frustration, disgust, or depression. (3) Motivation. Many patients have their motivation to get well reduced or destroyed through unnecessary delays. Not only have they become used to their condition, but many have had complications develop, such as frozen shoulders or contractures. If rehabilitation begins at the ideal time—within 24 to 48 hours after the accident takes place—motivation remains high.

Negative Factors. (1) Degree of spasticity. Certain patients do not build up enough muscle power to overcome spasticity which may develop and continue following the stroke. At times, practical use of the extremities is precluded. (2) Neurologic involvement of opposite side. A few patients may have mild signs of spasticity and incoordination on the unaffected side. With this added handicap, the patient may not be able to walk, or may have difficulty in grasping a parallel bar, crutch, or cane. Therefore, the favorableness of the patient's prognosis is decreased or negated in relation to the degree of the problem.

Common Pitfalls. (1) Visible physical aspect of patient. In many instances, it is easy to be misled concerning the rehabilitation potential of stroke patients. Their status may appear hopeless because of their prostration, lethargy, crying spells, absent dentures, tousled hair, incontinence, and so on. The same patient, if put in a chair, dentures inserted, hair combed, dry (because a bedpan was offered as frequently as needed), and possessing hope of something more in life than a bed existence, would give an entirely different impression. (2) Dehydration. The state of hydration is extremely important. An apparently completely hopeless case, even appearing near death, may undergo miraculous change simply as a result of attention to hydration.

Complications. (1) Constant drainage. Catheters should not be inserted in the bladder of the hemiplegic patient. The difficulties following prolonged catheterization, including chronic infection and delayed restoration of bladder control, often present complications which postpone return to the family circle. (2) Bed sores. Attention to dryness of the skin, avoidance of



pressure on the skin, and careful attention to general hydration and nutrition must be sustained to prevent decubiti. (3) Contractures. The range of motion of all joints, especially those on the weak or paralyzed side of the body, must be maintained by putting the joints through a complete range of passive motion two or three times a day.

The outlook for the stroke patient should be one of encouragement and optimism. Unfortunately, in most hospitals, the patient with a cerebrovascular accident is still considered primarily a disposition problem. On the contrary, stroke victims present interesting challenges. Something dynamic and specific can be done for the patient if the doctor is well informed and endowed with vision. (Bonner, C.D., Prognostic Evaluation for Rehabilitation of Patients with Strokes: *Geriatrics*, 14: 424-428, July 1959)

\* \* \* \* \*

### Physiology of Dumping Syndrome

Although gastric resection is now a safe and effective procedure, there are certain physiologic disorders which occur following surgery that present certain problems and undesirable sequelae of surgery on the stomach. These are collectively called postgastrectomy syndromes. Of them, the early postprandial dumping syndrome is the most frequently encountered. This phenomenon, a circulatory disturbance developing a short interval after ingestion, may follow any surgical procedure which alters normal gastric drainage and even may occur in individuals with intact gastrointestinal tracts, but in whom there is a rapid emptying time. This occurrence has been reported from 5 to 75% in various series.

The dumping syndrome is characterized by some or all of the following postprandial symptoms: weakness, sweating, pallor, nausea, vomiting, epigastric discomfort, palpitation, dizziness, and diarrhea. These manifestations usually develop within 10 minutes after a meal of high osmolarity and subside within 40 to 60 minutes. More objective manifestations of the dumping syndrome have been demonstrated during the period of symptoms and include: tachycardia, elevation in blood pressure, increased small intestinal intraluminal pressure and motility, electrocardiographic changes, decreased plasma volume, decreased plasma potassium and phosphate, increased urinary excretion of uric acid, decreased circulating eosinophils, hyperglycemia, decreased cardiac output, and increased digital blood flow. Because of the diversity of the physiologic alterations and the multiplicity of organ systems involved, the pathogenesis of this phenomenon has been ascribed to a variety of causes.

The subjects of the author's study consisted of 20 adult male patients who were studied for 6 months to 4 years following distal subtotal gastrectomy for benign gastroduodenal ulcerations. Several physiological alterations



confirmed previously reported observations. The cardiac rate was accelerated with the greatest increase occurring in the 20 to 30-minute period after ingestion. The systolic blood pressure rose significantly while diastolic pressure was not appreciably altered. The electrocardiographic changes observed—increased rate, lengthening of QT interval, flattening of T-wave, and elevation or depression of ST segment—were those commonly seen with the dumping syndrome. Increase in hematocrit, decrease in plasma potassium concentration, and fall in plasma volume were also observed.

The finding of particular interest was that of increased renal blood flow. The author's previous concept of pathogenesis of the dumping syndrome was that passage of undigested food into the small intestine caused an influx of fluid into the bowel lumen with a resulting decrease in blood volume which gave rise to vasomotor symptoms and electrocardiographic alterations. While this explanation has seemed logical, it is not unequivocally proven that fall in blood volume actually represents fluid loss into the bowel. It is difficult to explain why an increase in renal blood flow would occur, for if changes were initiated by fall in blood volume, a decrease in blood flow to the kidney would be expected. This suggests the presence of some vasopressor substance. One agent which is normally present as a result of stress phenomena—adrenalin—can produce such changes. Investigation of this hormone is under way.

Among other variations observed, a fall in serum level of potassium was an almost constant finding, presumably resulting from deposition of glycogen in tissues. This physiologic change might account for fall in urinary excretion of potassium despite the presence of increased activity of the adrenal cortex.

While this study does not solve the pathogenesis of the dumping syndrome, it adds data which indicate that physiologic alterations are more generalized than had been appreciated, and supports the concept that the entire sequence of events cannot be attributed to a change in plasma volume. The diversity of cardiovascular changes can best be explained on the basis of some systemically circulating agent which may affect various segments of the cardiovascular system. (Morris, G. C., Jr. et al., Physiologic Considerations in the Dumping Syndrome: Ann. Surg., 150: 91-97, July 1959)

#### Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.



### Stimulation of Bone Growth

Temperature and oxygen tension are probably the two most important physical variables affecting living cells. Physiologic alteration of either or both of these may influence the rate of growth of bone. Alteration of bone growth must be unilateral to be of clinical significance. In theory, growth would include: (1) unilateral augmentation of blood flow, (2) unilateral increase of tissue oxygen tension, (3) unilateral localized heating of the epiphyses, (4) application of unilateral distracting force to the epiphysis, and (5) unilateral stimulation of the nerve to a growing bone.

Poliomyelitis is by far the most common cause of a short leg, ranging in frequency from 60 to 90% of all cases treated. The severity of paralysis seems to be the responsible factor in producing shortening of the bone, and does not begin for a year or more after the acute illness. The postpoliomyelitic extremity is cool, atrophic, and without good vasomotor control, but the minute volume of blood flow through the extremity is not invariably decreased. Other conditions causing a retardation of bone growth include infections, tumors, or trauma.

Stimulation of bone growth has been noted in association with vascular disorders of the region, such as congenital diffuse hemangioma, arteriovenous fistula, and other conditions, such as chronic Brodie's abscess and neurofibromatosis (localized). The stimulus to bone growth under these circumstances may be the result of either increased volume flow of blood through the region or alteration of oxygen tension to the growing epiphysis.

The treatment of extremity inequalities by lengthening the shorter member has never gained wide acceptance because of the inherent difficulties of the procedure. The gain in length may not approach the desired amount despite resolution of all attendant difficulties.

Much experimental work has been carried out on stimulation of bone growth since the initial experiments by von Langenbeck in 1869, wherein he implanted a foreign body in the marrow cavity of a dog femur. Variations of this stimulus were employed by others over ensuing years with no reported increase of length of more than 5 mm. Recent work has conclusively demonstrated that this method is of little or no value. Similarly, drilling of the metaphysis and loosening of the diaphyseal periosteum have been of no value in stimulating bone growth.

A new procedure employed recently showed growth in bones of dogs from 4 to 15 mm., and consisted of fracturing the radius and ulna close to the epiphysis, followed by epiphyseal distraction through skeletal distraction. This process presented problems, however, and clinical trials have not been carried out. Unilateral sympathectomy resulting in stimulation of bone growth has not proved successful and the procedure has been abandoned. Attempts of stimulation of circulation to a region by the production of venous stasis have



likewise produced no appreciable results in bone lengthening. Bone lengthening as the result of an arteriovenous fistula is an accepted fact, although the means certainly are obscure at this time. A few surgeons have elected to augment bone growth by the production of an arteriovenous fistula. The average increased growth was between 1 and 3 cm. and was considered to result from the increased temperature and increased vascularization at the epiphyses.

Based on theoretical considerations and the light of clinical observations, the authors studied the effects of unilateral bone heating on bone growth. Heating was achieved by a few turns of nichrome wire through which was sent an alternating current of approximately 1.1 volts. This was enough to elevate bone temperature by 2° C. without raising general body temperature and in no way interfered with general metabolism and nutrition of the animal. Controlled heating and histological evaluations were carried out on 17 rats and 7 dogs. The average length increase was 5% with a 15 to 20% increase in weight of the bone, and an increase in the circumference of the bone as well. Precise physiological studies were not carried out, but injection studies of the circulation were completed and hypertrophy of the arterial and venous circulation was obvious.

Prolonged heating resulted in complications, principally fractures of the shaft of the bone. The fracture healed without difficulty and study of the excised specimen suggested that the fracture was related to an overgrowth of bone against the resistant nichrome wire. Occasional concentric thickening of the shaft of bones was noted, and on microscopic study the heated bone showed no alteration of bone architecture.

Following the initial study, effects of internal heating on healing of fractures was observed in 3 dogs. The heated side healed with solid bony union and more profuse callus formation than the unheated side. These initial observations suggest that this method of internal heating might be applied to the stimulation of fracture healing in adult human beings and in correction of delayed and nonunions. The rate of chemical reactions and the local blood supply would both be increased by this process. (Richards, V., Stofer, R., The Stimulation of Bone Growth by Internal Heating: Surgery, 46: 84-95, July 1959)

\*\*\*\*\*

BuMed Film Awarded  
International Film Festival Certificate

The Department of the Navy was recently awarded an exhibition certificate from officials of the International Film Festival in Venice, Italy, for the Bureau of Medicine and Surgery film, "Color Vision Deficiencies."



Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy, to whom was forwarded a copy of the certificate and a photograph of the presentation ceremonies for the files of the Bureau of Medicine and Surgery, received the following explanatory comments from the Commanding Officer of the U.S. Naval Photographic Center, Naval Air Station, Anacostia, Md.

"United States Government films entered in the Venice International Film Festival competition are very few in number. They are selected by the Inter-Departmental Committee on Visual and Auditory Materials for Distribution Abroad, under the chairmanship of the United States Information Agency. An international jury of film experts at Venice then selects the best films from thirty or more countries for exhibition and certification. It is an accomplishment for a Navy film to be chosen as among the best of the films of all government agencies, and of course, a much higher honor to achieve the final exhibition. This recognition is justly deserved and is a source of great satisfaction to this command.

The original certificate, now on display at the Naval Photographic Center, was presented by Doctor Gabriele Paresce, Counselor of the Italian Embassy, to the U.S. Navy at a recent ceremony at the United States Information Agency. I was honored to accept the certificate for the Navy."

Note: "Color Vision Deficiencies" (MN 8246), 20 min., 16 mm., sound and color, was made for the Navy in 1957 by Audio-Productions, New York City. It was prepared for instruction of Medical Department personnel responsible for administering color vision tests.

\* \* \* \* \*

#### Words of Approbation

Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy, recently received a letter from a Reserve officer, an Assistant Professor in a University Department of Surgery. The Surgeon General considered that some of the remarks of this officer would be of interest to all Medical officers.

"Dear Admiral Hogan:

A recent spell of training duty has encouraged me to put in writing . . . (an expression of) a hearty personal delight in the pattern of activity of the Medical Department over the past several years. As a Reserve Medical officer . . . I can hardly speak with authority, but . . . words of thanks and approbation may be as welcome to you as requests and criticism. . . .



Most striking of all favorable aspects, the career officers appear to be finding opportunities to express their professional attainments in the highest standards of performance. It is most reassuring to find them among the leading figures in various phases of medicine, particularly in areas of special interest to the Navy. As a result, the tenor of the Naval hospitals, of the various medical publications, and of official notices seems to be directed towards taking care of the sick and furthering good medicine, while at the same time preserving the stature and purpose of a military organization. Achieving such a balance is a rare feat, but is, as the present proves, entirely possible.

Such attitudes of progressive improvement and leadership in the field are most rewarding to those Reserves who have retained a loyalty and affection for the Navy outlasting terms of obligated service. . . . We all prefer to justify pride on grounds of excellence in addition to those of sentiment. Teaching, as I do, in a medical school, I can have no hesitation in saying to students, colleagues, and friends that the spirit and caliber of Navy medicine has reached a high level that contributes to, and stimulates, the entire medical effort of our country in addition to serving the Navy. . . . We all benefit from the success and enlightened policies of the Navy Medical Corps. . . . May the Medical Corps continue its successful ministering to the growth and excellence of medical care throughout the land. . . ."

\* \* \* \* \*

#### Film Release

#### Medical Defense Against Chemical Warfare

Two new color films in the Medical Department series bearing the general title, "Medical Defense Against Chemical Warfare" (MN-8266), now being distributed are: "Detection of Contaminated Water" (MN-8266b), and "Detection of Contaminated Food" (MN-8266c).

The new films, each 20 min. in length, are for personnel of the Medical Department and of service forces who may be required to test food and water supplies for contamination immediately after a chemical-warfare attack. "Detection of Contaminated Water" shows the AN-M2 Water Testing and Screening Kit and demonstrates step by step the techniques of its use in testing for arsenicals, mustards (including nitrogen mustard and cyanogen chloride), and G-agents. It also demonstrates its use in the determination of chloride demand and pH. Similarly, "Detection of Contaminated Food" shows the use of the AN-M2 Food Testing and Screening Kit in making detector-crayon tests and tests for arsenicals, mustards (including cyanogen chloride) and G-agents.

Other films in this series previously released are: "Basic Plan for Handling Casualties" (MN-8266a), and "Gas Attack Self-Aid" (MN-8266d),



both of which were described in the Medical News Letter, Vol. 32, No. 12, Page 21, 19 December 1958.

Prints of all four films are being distributed to Naval Hospitals, Hospital Corps Schools, District Training Aids Sections and Libraries, and Marine Corps Training Film Libraries. If prints are not available through the usual source address inquiry to Film Distribution Unit, Training Division, Bureau of Naval Personnel, Department of the Navy, Washington 25, D. C.

\* \* \* \* \*

### The New Look Ophthalmic Frame

The P-3 shape ophthalmic frame, which has been the standard issue item for approximately 10 years, is being replaced by a more modern design, the S-7 frame. The "New Look" ophthalmic frame—recently standardized—has a difference of 7 mm. less in the vertical than in the horizontal meridian, thus the name, S-7.

Presently, both P-3 and S-7 frames are being issued. The P-3 will be issued until present stocks are exhausted. It is anticipated that all sizes of the S-7 will be issued as the standard frame by 1 August 1959.

The P-3 spectacle fronts and temples were assembled at the factory and combination of the two were stocked as a single unit. Prescriptions were fabricated according to bridge and eye size requested on the DD-771 and unless specifically ordered otherwise spectacles were supplied with the temple lengths as procured from the factory. In most instances, therefore, it was unnecessary to state temple length on the DD-771 (Spectacle Order).

The S-7 spectacle front is stocked as a single unit and two types of temples, spatula or riding bow, are stocked as individual units. To insure proper fit for the patient and to provide adequate fabrication data for the laboratory it will be necessary to indicate on the Spectacle Order (Form DD-771) the bridge size, eye size, temple length, and temple style (spatula or riding bow) along with the pupillary distance (distance and near).

Listed below are the available S-7 frame sizes and temple lengths.

#### FRAME SIZES

<u>Eye</u>	<u>Bridge</u>	<u>Eye</u>	<u>Bridge</u>	<u>Eye</u>	<u>Bridge</u>	<u>Eye</u>	<u>Bridge</u>
42/35	x 18	44/37	x 18	46/39	x 20	48/41	x 20
42/35	x 20	44/37	x 20	46/39	x 22	48/41	x 22
42/35	x 22	44/37	x 22	46/39	x 24	48/41	x 24
42/35	x 24	44/37	x 24	46/39	x 26	48/41	x 26
42/35	x 26	44/37	x 26				

#### TEMPLE LENGTHS

(measured from hinge to crest (top) of ear)

<u>Spatula</u>	<u>Temple</u>	<u>Riding Bow</u>	<u>Temple</u>
4"	4-3/4"	4"	4-1/2"
4-1/2"	5"	4-1/2"	5"
4-3/4"			

Ophthalmic Lens Laboratory, Williamsburg, Va.



Postgraduate Short Courses at  
Armed Forces Institute of Pathology

Postgraduate short courses for Medical Corps officers, sponsored by the Armed Forces Institute of Pathology, Washington, D. C., will be given during Fiscal Year 1960 as indicated below. Eligible officers are those who meet the criteria prescribed by BuMed Instruction 1520.8.

Eligible and interested officers should forward requests via official channels, addressed to the Chief of the Bureau of Medicine and Surgery, to be received in the Bureau at least 6 weeks prior to commencement of the course requested. Travel and per diem orders chargeable against Bureau funds will be authorized for those approved for attendance.

<u>Courses</u>	<u>Dates</u>
Application of Histochemistry of Pathology.....	26 - 30 Oct 1959
Forensic Pathology.....	8 - 13 Nov 1959
Pathology of Diseases of Laboratory Activities..	7 - 11 Dec 1959
Pathology of the Oral Regions .....	14 - 18 Mar 1960
Ophthalmic Pathology .....	28 Mar to 1 Apr 1960

\* \* \* \* \*

Board Certifications

American Board of Dermatology

CAPT Dale B. Watkins MC USN

American Board of Internal Medicine

(Internal Medicine and Gastroenterology)

CAPT James H. Boyers MC USN

American Board of Neurological Surgery

LCDR Benjamin L. Crue, Jr., MC USN

American Board of Obstetrics and Gynecology

CDR Wendell A. Johnson MC USN

American Board of Orthopedic Surgery

CDR Frank L. Golbranson MC USN

American Board of Otolaryngology

CDR Fred A. Valusek MC USN

American Board of Psychiatry and Neurology in Psychiatry

LCDR Hans G. Preuss MC USNR (Active)



American Board of Radiology

CDR Garner L. Lewis MC USNR (Active)  
CDR Robert W. Spicher MC USN

American Board of Surgery

LCDR Robert I. Garrett MC USN  
CDR Joseph L. Whatley MC USN

American Board of Thoracic Surgery

CAPT Horace D. Warden MC USN

\* \* \* \* \*

IN MEMORIAM

CAPT Edward B. Hopper MC USN	30 June 1959
CAPT Lou C. Montgomery DC USN (Ret)	15 July 1959
CAPT George N. Schiff MC USN (Ret)	3 August 1959
CAPT Griffith E. Thomas MC USN (Ret)	3 August 1959
CDR Joseph C. Fagan MSC USN (Ret)	24 May 1959
CDR William L. Strangman DC USN (Ret)	9 April 1959
CDR Howard A. Tribou MC USN (Ret)	22 July 1959
LCDR Grace E. Beach NC USN	21 July 1959
LCDR Ernest N. Grover MSC USN	24 May 1959
LCDR Mary O'Neill NC USN	24 July 1959
LCDR Elizabeth (V) Warner NC USN	11 June 1959
LT Frank (N) Bosse MSC USN (Ret)	30 June 1959
WO Sigfred E. Smith MSC USN (Ret)	26 June 1959

\* \* \* \* \*

Recent Research Reports

Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Isolation and Characterization of Deposits of Secretion from the Acetabular Gland Complex of Cercariae of Schistosoma Mansoni. NM 52 02 00.01.04, 25 March 1959.
2. Metabolic Activity in Calcified Tissues: Aconitase and Isocitric Dehydrogenase Activities in Rabbit and Dog Femurs. NM 75 01 00.02.03, 6 May 1959.

Naval Medical Research Unit No. 3, Cairo, Egypt

1. Lyophilized Glycerol Pectate - Lot 18 for Plasma Volume Replacement and Expansion. NM 71 07 03.1.01, September 1958.



Naval Air Development Center, Johnsville, Pa.

1. A Study of the Effects of Positive Acceleration upon Erythrocyte Hydration in Human Subjects. NM 19 02 12.2, Report No. 1, 12 May 1959.
2. Effect of Temperature on Tolerance to Positive Acceleration. NM 19 01 12.1, Report No. 16, 26 May 1959.
3. G Tolerance in Primates. II. Observations on the Relationship of Carotid Pressure and End Point during Acceleration. NM 11 01 12.9, Report No. 2, 29 May 1959.
4. Preliminary Studies on the Mechanism of Radiation Damage to Oxidative Phosphorylation in Spleen Mitochondria. NM 00 01 12.7, Report No. 6, 9 July 1959.

Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. Effect of Environmental Factors on the Performance of Marine Corps Personnel. Pilot Study: The Use of Performance Tests and Questionnaires to Differentiate between Types of Body Armor - A Preliminary Investigation. NM 41 03 09, June 1959.

Naval Medical Research Laboratory, Submarine Base, New London, Conn.

1. Bibliography of Sensory Deprivation, Isolation, and Confinement. Memorandum Report No. 59-1, NM 23 02 20.03.02, 4 May 1959.

Naval School of Aviation Medicine, NAS, Pensacola, Fla.

1. Effect of Exposure Time upon the Ability to Perceive a Moving Target. NM 17 01 11, Report No. 2, Subtask No. 2, 6 January 1959.
2. Speaker Intelligibility: A Note on the Effect of Monaurally Delaying Airborne Side-Tone. Joint Project NM 18 10 99, Report No. 84, Subtask No. 1, 15 January 1959.
3. Some Effects of Differential Pressures Applied to the Head and Body of Rats. NM 12 01 11, Report No. 4, Subtask No. 5, 29 January 1959.

Naval Medical Research Unit No. 2, Taipei, Taiwan

1. Epidemiologic Studies of the 1958 Cholera Epidemic in Bangkok, Thailand. NM 52 11 02.3.3, 21 April 1959.
2. Epidemic Rubella in Taiwan 1957 - 1958. III. Gamma Globulin in the Prevention of Rubella. NM 52 05 02.1.2, 20 May 1959.
3. Intestinal Protozoans and Helminths in U.S. Military and Allied Personnel, Naval Hospital, Bethesda, Md., NM 52 11 02.1.3, 27 May 1959.
4. Epidemic Keratoconjunctivitis (E. K. C.). Part III. Adenovirus Isolation from E. K. C. NM 52 05 02 10.2, 4 June 1959.



From the Note Book

MC Flag Selections. The selection of three Navy Medical Corps Captains for promotion to the rank of Rear Admiral was approved by President Eisenhower on 27 July 1959. Those selected were: Captain James L. Holland, Staff of the Commander, Naval Air, Pacific; Captain Cecil L. Andrews, Commanding Officer, U.S. Naval Hospital, St. Albans, N.Y.; and Captain Cecil D. Riggs, Commanding Officer, U.S. Naval Hospital, Chelsea, Mass. Their appointments to flag rank will be made as vacancies occur.

AFIP Director to Retire. Captain W.M. Silliphant MC USN was relieved as Director, Armed Forces Institute of Pathology, by Colonel F.M. Townsend, USAF (MC) on 1 August 1959. Captain Silliphant served with the Institute for 7-1/2 years and has been Director for the past 4 years. He will retire from active duty on 1 September 1959 and will subsequently join the staff of the Cancer Research Institute and the Department of Pathology of the University of California Medical Center in San Francisco, Calif. (AFIP Letter)

Allied Military Nurses. An Annual Military Assistance Naval Training Orientation Course for Military Nurses of Friendly-Allied Countries has been formulated by the office of the Surgeon General of the Navy and approved by the Chief of Naval Operations, with the first class scheduled to convene in September 1959. Established in response to several requests from friendly-allied armed forces desiring to send nurses to the United States for further professional training, the course will be held at the U.S. Naval Medical School, National Naval Medical Center, Bethesda, Md.

Brazilian Congress. Captain Ralph D. Berry MC USN has been named representative of the Office of the Assistant Secretary of Defense (Health and Medical) and as the Navy Medical Department representative to the Second Brazilian Congress on Military Medicine to be held in Port Alegre, Brazil during August 1959. Captain Berry is presently assigned in the U.S. Mission to Brazil, Rio de Janeiro.

Aminophylline. Employing a control group, the authors evaluated the effects of aminophyllin on two groups of patients with selected types of cardiac and pulmonary disease. Their findings were: In normal persons and patients with mitral stenosis, coronary blood flow decreased with increased myocardial oxygen extraction. The cardiac metabolic rate for oxygen was maintained. No evidence of a coronary vasodilatory action was found. (G.M. Maxwell, M.D., et al. J. Lab. and Clin. Med., July 1959)

Hepatic Encephalopathy. As a result of their evaluation of the effect of two ammonia-binding substances, the authors conclude that endogenous ammonia



alone probably is not the sole neurotoxic factor in spontaneous encephalopathy in patients with severe liver disease. Arterial ammonium levels were reduced with increase of cerebral blood flow and oxygenation—all without significant change in the clinical states of the patients studied. (W. K. Young, B. S., et al., Am. J. M. Sc., July 1959)

Cross-Examination. This discussion, prepared by a physician, a lawyer-physician, and a lawyer presents many suggestions in relation to the physician's position as an expert witness, stressing effective testimony during cross-examination. (R. R. Merliss, et al., New England J. Med., 23 July 1959)

Gastric Ulcer. The author contends that roentgen examination amounts to gross examination in vivo with an added dimension, and that it is possible for the radiologist to make the distinction between ulcer and cancer in a very high percentage of cases. Quoting his study of 100 consecutive proved cases of gastric carcinoma with an accurate preoperative x-ray diagnosis in 81%, he considers that his opinion is justified. (Israel Kirsh, M. D., Gastroenterology, July 1959)

Temperomandibular Joint. In relation to temperomandibular joint dysfunction, the holistic attitude must be adopted by the practitioner to avoid unnecessary radical procedures. Frequently, the emotional status of the patient plays a total or partial role in the production of the symptoms of this dysfunction. Electromyographic, emotional, and anatomical evaluations were made on a series of patients presented in the report. (W. L. Kydd, D. M. D., J. A. D. A., July 1959.)

Bronchiolar Carcinoma. The new concept that bronchiolar carcinoma may arise from bronchiolar adenomatous malformation, in single or multiple foci, is put forth by the authors. The resemblance to the bronchiolar adenomatous malformations in photomicrographs and histologic descriptions of reported cases of bronchiolar carcinoma is discussed. Whether some of the reported cases of bronchiolar carcinoma are indeed malignant neoplasms is questioned. (S. L. Eversole, Jr., M. D., W. F. Rienhoff III, M. D., J. Thoracic Surg., June 1959)

Dental Caries. The author of this article presents a theory concerning the development of dental caries, based on the heretofore unknown existence of glycogen in the dental enamel. He contends that caries is not caused by a lack of an element in the diet but by overconsumption, in particular by an excessive intake of carbohydrates during the formative period of the teeth. (E. Egyedi, M. D., D. S., Amsterdam, Holland, Dental Digest, July 1959)



Tolbutamide. Reporting from the Royal Victoria Hospital in Belfast, the authors concluded from study of patients, that tolbutamide did not alter the capacity of exogenous glucagon to produce hyperglycemia. This is in contrast to the opinions of others that tolbutamide intensifies the response to glucagon, or antagonizes the hyperglycemia effects of glucagon. Their opinion confirms the belief that glucagon increases hepatic glycogenolysis by influencing the phosphorylase enzyme system. (C.K. Gorman, M.B. Belfast, J.A. Weaver, M.D., Belfast, *The Lancet*, 11 July 1959)

Adrenal in Pregnancy. Jailer et al report increased hydrocortisone in the free plasma during pregnancy or estrogen administration. However, there are no evidences of hypercorticism, and no suppression of ACTH secretion. In view of this paradoxical situation, it is speculated that there must be some mechanism whereby a large portion of the hormone is rendered inert in relation to the exertion of inhibitory effects upon the cells of the adenohypophysis or widespread metabolic effects upon other tissues of the body. (J.W. Jailer et al., *Am. J. Obst. & Gynec.*, July 1959)

Cerebral Palsy. A new meprobamate derivative, Soma, was employed in a preliminary evaluation of treatment of cerebral palsy. Improvement in spastic patients and those with rigidity was substantially greater than in athetoid patients. Dosage was kept at the level required to relax the contractures and not increased to the point of causing weakness. There were no adverse effects, and side-effects were limited to lethargy or drowsiness. (W. M. Phelps, M.D., *Arch. Pediat.*, June 1958)

Radioautography. This technique, making it possible to determine directly the distribution of radioactive material in the tissues, was employed to trace the distribution of penicillin in various body tissues. A high concentration was found in the kidneys, liver, and lungs; only a little was traced in the muscles, virtually none in the brain. Between the placenta and the fetus, a barrier was evident similar to that between the blood and brain. Penicillin penetrated abscess cavities, although in low concentration in chronic cases. When renal excretion was blocked with Probenecid, penicillin was eliminated through the nasal mucosa and hair follicles. (*Méd. et hyg. (Switz.)*, 17:82 1959)

Murmurs. In the problem of differentiation of the pansystolic regurgitant murmurs in the adult which may be due to mitral regurgitation, tricuspid regurgitation or ventricular septal defect, the authors demonstrate that the employment of nor-epinephrin which raises the systemic diastolic arterial pressure aids in the identification of the etiology of the sound. With this technique, the tricuspid lesion will not manifest any change in character of the murmur while the other two lesions will be evident by specific alterations of the sounds.



(L. A. Soloff, M. D., et al., The Pansystolic Regurgitant Murmur: A Simple Method of Identifying its Anatomic Source: Am. J. M. Sc., 237: 744-748, June 1959)

Left Ventricular Hypertrophy. Evaluating the reliability of criteria for electrocardiographic diagnosis of left ventricular hypertrophy, correlation of the features of tracings with anatomical findings was made in 200 successive patients who exhibited left ventricular hypertrophy at autopsy. The most significant abnormalities were the characteristic ST-segment and T-wave changes which were seen in 55% (80% if patients with obvious myocardial infarction or bundle-branch block were excluded.) Amplitude of the QRS complex was quite unreliable with only 22% showing this variation. (A. H. Griep, M. D., Circulation, July 1959)

Magnesium and Labor. Incident to the use of intravenous magnesium sulfate in the treatment of toxemia of pregnancy prolongation of labor has been observed. Assessing the role of the magnesium ion in producing this effect, the authors found that magnesium inhibited the contractility of isolated muscle tissue excised from gravid human uteri; and in clinical experience, did have a depressant action on uterine motility, although this effect did not detract from its use as the anticonvulsant of choice in the toxemias of pregnancy. (D. G. Hall, M. D., et al., Am. J. Obst. & Gynec., July 1959)

#### BUMED NOTICE 6230

22 July 1959

From: Chief, Bureau of Medicine and Surgery  
To: Ships and Stations Having Medical Personnel

Subj: Influenza vaccination program for 1 October 1959 - 31 July 1960

This instruction provides information concerning the utilization of polyvalent influenza virus vaccine by military activities during 1959 - 1960. Vaccine shall be administered during October 1959 to all naval personnel on active duty; and to personnel who enter on active duty between 1 October 1959 and 31 July 1960, including those entering active duty for training for periods in excess of 30 days. In addition, all dependents 6 years of age and over shall be offered the vaccine on a voluntary basis.

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 19 June 1958.



**DENTAL****SECTION**Management of Gagging Patients

Gagging frequently prevents optimal performance of various dental procedures and is troublesome to patients who must wear complete dentures.

The etiology of gagging and vomiting is believed to be from irritation of sensitive areas of the posterior pharyngeal wall, soft palate, uvula, fauces, and dorsum of the tongue's posterior portion. Tactile, visual, acoustic, chemical, olfactory, or psychic stimuli may trigger the gagging reflex.

In complete denture prosthesis, a well-planned and well-constructed denture is essential. Maximum retention, an adequate vertical dimension, a sufficient posterior palatal seal, a balanced occlusion, and a correct inter-occlusal distance are most important.

Gagging or vomiting may result from biomechanical factors in the construction of the dentures or from psychogenic factors. When biomechanical factors have been eliminated, drugs may be used to deal with the psychogenic aspect of gagging and to block stimuli which provoke the gagging reflex.

A number of drugs may be used to resolve such situations so that manipulative procedures may be carried out and the initial resistance to wearing dentures may be overcome.

Since the vomiting reflex is a function of the parasympathetic portion of the autonomic nervous system, drugs that selectively depress this system are useful. Among these drugs are the sedatives, antihistamines, parasympatholytics, and the central nervous system depressants. (M. L. Schole, B.S., D.D.S., Excerpts from article, *Journal of Prosthetic Dentistry*, 9: 573-583, July - August 1959)

\* \* \* \* \*

More About Fluoridation

The water supplies of 3,703 communities with a total population of over 42,000,000 people contain fluorine either naturally or through controlled addition. This indicates that one of every three people in the country using central water supplies now drinks fluoridated water in sufficient quantity to prevent two out of three dental cavities.

\* \* \* \* \*



### Personnel News

CAPT R. A. Colby DC USN was elected President-Elect of the American Academy of Oral Pathology and CDR H. H. Scofield, Jr. DC USN was elected Vice President of the Academy, both for the year 1959 - 1960.

CAPT G. C. Rader DC USN has relieved CAPT R. S. Snyder DC USN as Head, Planning and Analysis Branch, Dental Division, Bureau of Medicine and Surgery. CAPT Rader, prior to this change, was Assistant Head of that branch.

In a Change of Command ceremony, 30 June 1959, at the U. S. Naval Dental Clinic, Brooklyn, N. Y., CAPT E. J. Holubek DC USN relieved CAPT F. W. Lepeska DC USN as Commanding Officer of the U. S. Naval Dental Clinic, U. S. Naval Base, Brooklyn, N. Y.

In consonance with the policy of giving as many officers as possible the opportunity for command status, the following changes in commanding officers of Naval Reserve Dental Companies became effective 1 July 1959:

NRDC 12-1 - CDR D. J. Potter (DCR) for CDR C. E. Butler (DCR)  
NRDC 12-2 - CDR B. J. Harris (DCR) for CDR J. V. Shahbazian (DCR)  
NRDC 12-3 - CDR J. H. Ingles (DCR) for CDR R. A. Cupples (DCR)  
NRDC 12-8 - CDR R. A. Whiting (DCR) for CDR M. C. Funk (DCR)

\* \* \* \* \*

### Dental Service Report (DD 477)

#### Errors in Submission

Numerous errors have been noted in the Dental Service Reports (DD 477) and the consolidated DD 477's from submitting activities. Examples of the more common errors are:

Late reporting. Write-in entries not placed in proper classification.  
Examinations greater than patient load.  
Unauthorized treatments (orthodontics) not explained in Remarks Section.  
Incomplete reports.  
Total procedures in error.

It is essential that close attention be given to the instructions contained in Article 6-150, Chapter 6, (Rev.), Manual of the Medical Department, to assist in the proper preparation of the Dental Service Report. Closer monitoring of reports by reviewing officers will do much to eliminate the submission of erroneous reports.

\* \* \* \* \*





## RESERVE SECTION

### Armed Services Orthopedic Seminar

The first Armed Services Orthopedic Seminar will be convened at the U.S. Naval Hospital Oakland, Calif., 23 - 25 September 1959, under the sponsorship of the Commandant, Twelfth Naval District.

Eligible Naval Reserve Medical Corps officers on inactive duty may be credited with one retirement point for each day's attendance provided registration is made with the military representative present.

\* \* \* \* \*

### Annual Meeting of the American Psychological Association

The American Psychological Association will hold its annual meeting at the Sheraton-Gibson and Netherland Hilton Hotels in Cincinnati, Ohio, 3 - 9 September 1959.

Selected sessions considered to have military significance will be indicated on the program. These sessions will provide information and techniques employed in psychology which are not readily available in civilian pursuits, but invaluable in the event of mobilization.

Eligible inactive Naval Reserve Medical Department officers may receive one retirement point credit for attendance at each daily session provided registration is made with the military representative present.

\* \* \* \* \*

### Revision of Promotion Policy

A change has been made in the policy governing the promotion of Naval Reserve officers on inactive duty. Effective with selection boards convening in fiscal year 1961, officers will be required to earn 12 retirement points during their anniversary year which will end in the fiscal year immediately preceding the fiscal year in which they would be considered for promotion by selection boards.

The anniversary year for Reservists who were members on 30 June 1949 extends from 1 July through 30 June, coinciding with the fiscal year. However, for those members who entered after 30 June 1949 or whose Reserve service was broken after that date, the anniversary year extends from the date of entry of reentry.



An example of the latter situation could be the case of an officer who entered the Naval Reserve on 1 April 1950. The anniversary year of that officer would begin on 1 April and end with 31 March. If he were in the promotion zone in fiscal year 1961, it would be necessary for him to have earned 12 retirement points during the period 1 April 1959 through 31 March 1960 in order for him to be eligible for consideration by a selection board convening during fiscal year 1961.

For fiscal year 1960, eligibility for consideration will be established by having earned the 12 retirement points during fiscal year 1959 or in the anniversary year ending in fiscal year 1959.

The change in policy is expected to simplify administrative procedures at the Reserve Officers Recording Activity (RORA), which posts retirement points according to each officer's anniversary year.

Officers still must earn an average of 24 promotion points for each year in grade in order to qualify professionally for promotion. BuPers Instruction 1412.1D contains complete details. (The Naval Reservist, May 1959)

\* \* \* \* \*

#### New Identification Cards for Inactive Reservists

A new identification card system will soon be in effect for Naval personnel. Under the new plan, three cards, designated DD Form 2N, will be used as follows:

The identification card printed in green "security-type" ink will continue to be issued to members of the Regular Navy and Naval Reservists who are serving on extended active duty.

An identification card printed in gray "security-type" ink will be issued to members of the Regular Navy and Naval Reserve who are entitled to retired pay.

An identification card printed in red "security-type" ink will be issued to Naval Reservists who are not entitled to either the green or gray card. Thus, Reservists serving on inactive duty and those who are not retired with pay will be issued the red card.

The buff colored Uniformed Services Identification and Privilege Card, DD Form 1173, will continue to be issued to personnel not on extended active duty until the new red and gray cards are printed and distributed.

The availability of the red and gray cards and instructions governing their issuance will be announced in a few months. Meanwhile, no action need be taken.

Holders of the buff identification cards, DD Form 1173, will not be required to change to the red or gray cards.

\* \* \* \* \*



## AVIATION MEDICINE DIVISION



### Indoctrination and Fleet Evaluation of the Navy's Full Pressure Suit

Many squadrons soon may be receiving the full pressure suits. Therefore some information in way of indoctrination may be of assistance. Training in the use of this equipment is being given at the Naval Air Station, North Island, San Diego, Calif., and the Naval Air Station, Norfolk, Va. Because of the newness and somewhat uniqueness of the full pressure suit and since the response to the suit is varied, the indoctrination needs to be tailored to each individual. Generally, it requires about three days to fit and indoctrinate pilots. Air group flight surgeons and parachute riggers should accompany pilots for this indoctrination.

During the first day, an initial fitting of the suit is made along with a medical examination and review of the pilot's medical record. Initial selection of a suit is somewhat of a trial and error method since body measurements will not reveal exactly which of the twelve sizes will precisely fit the pilot. The probable suit, judging from measurements, is tried on the pilot. If it does not fit precisely, other sizes are tried until the best fit for the pilot is obtained. Following this initial fitting, a forty-minute lecture is given covering a general discussion of high altitude flight, anti-immersion protection, crash protection and general operation of the equipment. The initial lecture phase is important because it is at this time that the pilot recognizes the need for the equipment. He must be sold on it as completely as possible to have every confidence in it. It is not enough to say to the pilot that he must use the equipment to fly above a certain altitude, the instructor must explain why and must document this "why" with actual incidents and conditions at high altitude flight. Once need for the suit is firmly established and the pilot realizes that the Navy's full pressure suit is an outstanding development, half of the battle is won. Following the lecture, additional adjustments of the suit are made and the ancillary equipment (such as the harness, et cetera) is fitted. This is followed by a detailed lecture on the suit and its component parts, suit control system, and breathing regulator. When it is felt that the pilot understands the suit, he puts it on and experiences some sea level pressurizations gradually increased from 1/8 psi to 1 psi.



The second day is utilized primarily in familiarizing the pilots with the suits. This is accomplished by wearing the suits as much as possible throughout the day. Sea level pressurizations are given gradiently to 3.4 psi in a mockup ejection seat, and while flying an instrument hop in a Link trainer. The Link trainer is merely used to keep the pilot occupied while he is going through the various pressure stages within the suit. It is during this familiarization period that the pace of the "tailored" type of indoctrination is set. The instructor has to see and feel how far and how fast he can go with each individual pilot. When the instructor feels that the pilot is ready, the chamber flight is started, which again is "tailored" to the type of aircraft that the pilot is flying. If the peak altitude of the aircraft is 60,000 feet, the chamber flight is to 60,000. The chamber flight also consists of a rapid decompression from 30,000 to 62,000 feet. At the end of the program, a review and debriefing period is held.

During a twenty-month period at the North Island unit, approximately 400 Naval, Air Force, and civilian personnel have worn one of the various model high altitude suits. Only three persons were considered to be unadaptable psychologically, and only two persons required specially constructed suits because of unusual body dimensions.

From experience it has been found that several factors are important during the indoctrination period. One factor is a personalized treatment. An attempt is made to assign one instructor to each pilot. This single instructor follows the pilot through the entire period of indoctrination. The second factor is the tailoring of the indoctrination. Those pilots who accept the suit and training readily are moved along rapidly. Those who are a little hesitant receive a slower rate of training. The third, and perhaps most important factor, is the absolute necessity for a well trained, confident, and enthusiastic instructor.

Regardless of the effectiveness of a piece of equipment, its final and most severe test is acceptance by the individuals for whom it is designed to protect. Fleet evaluation gives valuable information as to the acceptability. Fleet evaluation also gives the final test of compatibility of the protective equipment, the man, and the area in which the equipment is designed to operate. Acceptance and compatibility are particularly important in use of the full pressure suit. Occasionally there is "wearing" acceptability during the training period, but failure is encountered when the man and his protective equipment are expected to operate within the confines of an already crowded cockpit. Failures also come to light with the accessory equipment necessary to unite the man, pressure suit, and aircraft. Much of the earlier evaluations were ably accomplished by the Naval Air Test Center and VX-3 of the Operational Development Force.

Five pilots of VF-124, Naval Air Station, Moffett Field, were selected to act as a fleet evaluation team for the early model Mark II Navy full pressure suit. All five accepted the training well and psychologically adjusted to the suit. They put in over 80 hours of flight time in the suit with the F8U-1 aircraft and



reported that the suit was safe for flying, but that they could recommend its use for training flights only. These same five pilots were then fitted in later lightweight Mark III, Model O, full pressure suits and reported only a few discrepancies as far as the suits were concerned, but they did want some changes in the pilot-to-plane connections (D-500) and the backpack configurations. During this period, later versions of the integrated torso harness, ventilation garment, and helmet were received. With these improvements, these pilots reported that the new lightweight suit was acceptable for operational use.

Twenty contract test pilots from Chance-Vought Aviation, McDonnell Aviation, Pratt-Whitney, North American, Douglas, and Curtis-Wright were issued and indoctrinated in the lightweight Mark III, Model O, full pressure suits. There was excellent acceptance and these pilots all reported favorably on the suit in flight.

In December 1958, the VF-142 squadron, Naval Air Station, Miramar, Calif., was the first Navy squadron to be completely outfitted with the full pressure suit. The following are being evaluated: (1) flight compatibility; (2) storage at the squadron and on the carrier; (3) maintenance; (4) points of failure with repeated use; (5) cooling problem during donning, from ready room to aircraft, during preflight, and during cockpit hookup and check; (6) helicopter rescue procedures; and (7) over-all carrier operations with the suit. Pilots of VF-142 represented a normal cross section of the usual fighter pilot squadron and almost all were outfitted in the Mark IV, Model O, Navy full pressure suit. Because of size difficulties, a few had to be fitted in the Mark III, Model I, Navy full pressure suit. Indoctrination was completed prior to their deployment aboard the USS RANGER.

An interim report submitted by the squadron after each pilot had had at least four hours flight time in the suit indicated that they, too, considered it satisfactory for operational use. Most of the pilots stated that they would rather wear the full pressure suit than the anti-immersion suit. They also found the headpiece more comfortable than the A13A mask and APH-5 helmet combination and that visibility and head mobility were excellent.

This report indicated that omni-environmental features of the suit should be stressed more during indoctrination. In the past, training seemed to overstress altitude protection and to be concerned too briefly with the fine anti-immersion protection, crash, heat, cold, and wind-blast protection that this equipment affords. Increased flight experience has indicated and brought about the following changes: (1) a backpack to a seatpan configuration; (2) removal of the D-500 with an alternate simpler connecting system; (3) improvement of integrated harness; (4) sunvisor improvement; (5) improvement on entrance zipper and mode of donning; (6) improvement of glove, and (7) improvement in the headpiece and neck ring. Reports from contract test pilots have also yielded valuable information concerning comfort and mobility in relation to the fitting of the suit.



The procedure at present is to fit the suit primarily for maximum mobility and comfort in the normal flying condition (unpressurized) and to take up on the lacing adjustments to decrease bulk, but not at the expense of mobility or comfort. When fitted in this manner, the Mark IV suit increases only slightly in bulk or area dimension when pressurized. The cockpit dimensions of the F8U-1, F8U-2, F4H, A3J, F-104, F-102, and X-15 have ample room for this slight increase. In the F4D, however, the area dimension of the suit is more critical because of compactness of the cockpit. In fitting pilots of this aircraft a compromise must be made in comfort but not in mobility by taking in the lacing adjustments to keep the fullness to a minimum.

The general feeling is, and instructions to the pilot are, that this suit is an emergency get-down garment and that there will be no attempt to stay at altitude once the suit becomes inflated due to loss of cabin pressurization above 35,000 feet. But this does not mean that the pilot cannot, if he so chooses and the situation warrants, remain at altitude. As a matter of fact, in the flight testing of the F4H aircraft, because of loss of cabin pressurization from the test instrumentation lines running into the cockpit, many flights were made with the cockpit altitude well above 35,000 feet and with the pilot in the suit in the pressurized condition. Both the Navy test pilots and the contract test pilots reported that there was no difficulty in flying the aircraft even pressurized in the suit to 1-1/2 psi for periods of 30 to 45 minutes. To the pilot, this means that in case of loss of cabin pressurization at altitude there is no urgency to nose the plane over and get down immediately. It means that he will have more time to take stock of the situation and more altitude for him to attempt relights. One rather important point was brought out by pilots of VF-142. During their training period part of their syllabus called for flights above 50,000 feet. Up to this time, because of physiological limitation on altitude without pressure suits, this part of the syllabus could not be carried out. However, after they had been issued the suits, this portion of the syllabus was performed. The training officer and pilots report that the feeling of safety by wearing the suit and going to these altitudes allowed them to get a better feel of the aircraft and to develop full operational envelope of the aircraft. As a sidelight, it also put the maintenance officer on somewhat of a spot because it weeded out those aircraft that could not get above 55,000 feet.

Success and acceptance of the lightweight Mark IV Navy full pressure suit in no way indicate that the Bureau of Aeronautics or the Air Crew Equipment Laboratory are completely satisfied. They are still working on improvements to increase comfort and mobility, decrease weight, and supply compatible accessory equipment. Nevertheless, it is heartening to have Navy pilots drop into the training units and ask how they can get a Navy full pressure suit.

In addition to its primary function of indoctrination in the full pressure suit, training units have been assigned to a number of testing and evaluational



studies in connection with the full pressure suits. The North Island unit, for instance, has tested the effectiveness of an anti-fogging compound, underwater escape with the suit, explosive decompression studies with the suit, ground cooling units, and has conducted a series of habitability studies at altitude. These studies consisted of 2, 4, 8, 16, and 24-hour periods at 80,000 feet in the full pressure suit. During these periods, heart rate, respiratory rate, continuous ECG, and performance of psychological tests were observed; stress measurement studies were made; total oxygen consumption was calculated; and the drying effect on the nasal, oral, and eye mucosa of long periods of exposure to an atmosphere of 100% oxygen was determined. These tests indicated that even with the 24-hour study at 80,000 there were no significant changes from normal in any of the measurements or in general over-all physical well-being of the pilots. The unit at the Naval Air Station, Norfolk, extended their run to 72 hours and also found little or no significant physical changes.

The North Island unit did a series of studies with Litton Industries both with their high altitude garment and the Navy's full pressure suit in their chamber which has altitude capabilities of 200 miles. These studies were particularly concerned with depression and inversion of the "T" waves of ECG tracings that were observed in some of the Litton subjects. A series of studies to determine effectiveness of the protection of the Navy full pressure suit afforded against ambient temperatures up to 250° F. were undertaken with Convair. Preliminary data indicate that the standard "unsilvered" Navy full pressure suit would afford one hour protection if inlet vent air flow of 150 lpm and temperature of 5° F. were supplied. Using a silvered flight suit over the full pressure suit, 150 lpm vent air of 40° F. would afford protection for one hour.

In the spring of 1959, ComNavAirLant authorized several squadrons and detachments to be indoctrinated and to use full pressure suits. These indoctrinations are now under way at the Naval Air Station, Norfolk, Va. However, inasmuch as the training air group in NavAirLant is located at Cecil Field, Fla., it is planned to move this training unit to Cecil Field as soon as the facilities are completed there. (LCDR W. L. Goldenrath MSC USN, Naval Air Station, North Island, San Diego, Calif.)

\* \* \* \* \*

#### Cardiac Arrest

The following articles and professional films are recommended for study in arriving at a procedure for the management of cardiac arrest:

"Treatment of Cardiac Arrest Occurring During Surgery," J. H. Kay, R. Dever, R. A. Goertner, G. C. Kaiser, J. A. M. A., 163: 165-167, January 19, 1957)



"Cardiac Arrest and Resuscitation," B. B. Milstein, Annals, Royal College of Surgeons, England, 19: 69-87, August 1956.

"Cardiac Arrest at Work - Penknife Thoracotomy with Recovery," C. D. Brown, J. Knudson, G. F. Schroeder, J. A. M. A., 163: 352-353, February 2, 1957.

"Cardiac Arrest," H. Swan, J. C. Owen, silent, color, 32 minutes, procurable from: Henry Swan, M. D., 4200 E. Ninth Ave., Denver 7, Col.

"Cardiac Arrest," E. H. Fell, L. Peterson, sound, color, 17 minutes, procurable from: Surgical Products Division, American Cyanamid Company, Danbury, Conn.

"Resuscitation for Cardiac Arrest," C. S. Beck, sound, color, 20 minutes, procurable from: E. R. Squibb and Sons, 745 Fifth Ave., New York 22, N. Y.

(U. S. Air Force Medical Digest, April 1959)

\* \* \* \* \*

#### Reserve Seminar in Aviation Medicine

The Fourth Annual Research Reserve Seminar in Aviation Medicine was held at the U. S. Naval School of Aviation Medicine, Pensacola, Fla., 8 - 21 March 1959. Forty-two Reservists attended, of whom 26 were Navy, 12 were Air Force, and 4 were Army.

The Chief of Naval Air Training, RADM Robert Goldthwaite USN; RADM Rawson Bennett USN, Chief of Naval Research; CAPT Charles F. Gell MC USN, Special Assistant for Medical and Allied Sciences in the Office of Naval Research; and staff members of the School of Aviation Medicine addressed the group. Visits to outlying fields to observe details of the training program and to Eglin Air Force Base were conducted. In addition, one day was spent on board the USS ANTIETAM to observe carrier qualification operations.

CDR Richard Trumbull MSC USNR served as Chairman; CDR H. A. Imus MSC USNR planned and directed the Seminar. The next Seminar in Aviation Medicine will be held at the School of Aviation Medicine in March 1961 since the Seminar alternates on an annual basis with the Seminar in Submarine and Diving Medicine.

\* \* \* \* \*

#### The Navy Doctor

In no branch of Medicine, military or civilian, can one find such diversified activities as are found in the Medical Corps of the United States Navy. Every possible specialty of medicine is practiced by Navy doctors from Pediatrics and Obstetrics through the various medical and surgical specialties,



Aviation and Underwater Medicine, ABC Warfare, Tropical Medicine, and finally, Field Medicine. No other branch of military medicine encompasses so many aspects.

The opportunities for a young doctor entering the U. S. Navy are limitless. A young doctor just out of medical college can intern at one of the top medical centers of the world . . . (among which) is the U.S. Naval Hospital, Bethesda, Md. If he chooses otherwise, he can intern at a civilian hospital of his choice and then following completion of internship enter the Navy as a Lieutenant, senior grade. At this point in his medical career, several avenues are opened to him. First, he . . . (may apply for) a Navy residency of his choice to continue in the field of his liking (provided he accepts a commission in the Medical Corps of the regular Navy). Second, he may enter into specialized military training in such fields as Aviation Medicine, Underwater Medicine, and Tropical Medicine, to mention only a few. Last, he may simply enter the service to fulfill his two years of obligatory duty under the Selective Service Law.

Residency training in the Navy is as good or better than residencies found elsewhere. There are no limitations as to the type of residency training desired for if the Navy has not the facilities to train her men in certain fields, such as Neurosurgery, then this specialized training is arranged at civilian hospitals.

There is never the fear of the low "resident's salary" so prominent in many of our leading teaching institutions, for the resident in the Navy is paid according to his rank. One of the most interesting points of this entire subject is the fact that recent statistics show that the number of board examinations taken and passed is markedly higher in the Navy, as in the other military branches, than in civilian residency programs. The exact reason for this is unknown, but it certainly is a point in favor of the military residency program.

The specialized fields of military medicine are most interesting and most important in view of recent trends. Here, I speak of Aviation Medicine and Underwater Medicine, especially. The former is becoming more and more necessary as we near man's first venture into space. Of course, we think that this is far away, but mammoth strides are being taken daily and these first attempts are nearer than we realize. The question of man's underwater endurance for periods of days, weeks, and even months is being answered by Navy doctors as in the recent undersea adventures of our atomic submarines in the Arctic and Antarctic seas, Atomic, Biological and Chemical Warfare and all of their ugly and devastating possibilities are under constant investigation for protection of our nation, advancement of recent developments and yes, even retaliatory efforts if they need be resorted to. Tropical Medicine, a small but important facet of modern day medicine, is becoming more and more significant in light of steady migration of other peoples into our country, especially from Puerto Rico.

Probably the most versatile group of Navy doctors are those who enter into the Navy for fulfillment of their Selective Service obligation. The opportunities presented to this group are many and the duties that these men are to



perform are quite diversified. After a short period of indoctrination, the doctor may be sent to any one of many duty stations. Included among these are sea duty aboard one of many types of ships from destroyers to aircraft carriers; duty with the Marines, where often Field Medicine is practiced; or duty in one of the many shore dispensaries throughout the world. With this short but interesting tour of duty the Navy doctor can "see the world." In many instances this short period of time is a period in which the young doctor will "find himself," and thus be enabled to take giant strides in a particular direction in his medical career. A young doctor who may have started a residency and then had it interrupted by his obligated service . . . (may in some) instances be able to continue in (the practice of) his specialty during his short tour of duty.

In summary, therefore, the career of a Navy doctor is one which is interesting, exciting, educational, and quite rewarding. And, more important, it gives him the opportunity to serve his country. (LT Patrick S. Pasquariello, Jr., MC USNR, MCAS Cherry Point, N. C.)

Note: This article originally appeared in the July 1959 issue of the St. Joseph's Hospital Staff News, St. Joseph's Hospital, Philadelphia, Pa. LT Pasquariello, presently attached to the 2nd Marine Aircraft Wing, Cherry Point, N. C., was graduated from Jefferson Medical College in 1956 and subsequently interned at St. Joseph's Hospital.

DEPARTMENT OF THE NAVY

U. S. NAVAL MEDICAL SCHOOL

NATIONAL NAVAL MEDICAL CENTER

BETHESDA 14, MARYLAND

OFFICIAL BUSINESS

Permit No. 1048

POSTAGE AND FEES PAID  
NAVY DEPARTMENT